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Sub Series  
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THE SECRETARY OF DEFENSE  
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Circa

Disarm - Nuc. Test Ban Neg 7/30/62 meeting

- D R A F T

MEMORANDUM FOR THE PRESIDENT

SUBJECT: The US-USSR Military Balance With and Without a Test Ban

A. With Continued Testing

1. Strategic Retaliatory and Defense Forces

a. The United States today has a considerable strategic superiority only in part because the higher yield to weight ratio of our warheads has permitted the development of small, well-protected delivery systems. More important has been our generally more advanced military technology, our greater investment in major nuclear forces and our better planning of them. The recent Soviet test series enables the Soviets to produce high yield weapons almost as efficient as ours. Even without further testing, the Soviets can, if they choose, produce warheads for increased numbers of smaller, well protected missiles which could come into operation during the mid and late 1960's. Further testing would enable both sides to make only modest increases in the efficiency of the higher yield warheads, since both sides are already close to the potential limits. The U. S. advantage in small weight - high yield weapons (e.g. for use in clusters in ballistic missiles or in smaller, cheaper missiles) will undoubtedly diminish with continued Soviet testing. Moreover, Soviet and American decisions on the composition and character of strategic and defensive forces will have a much greater impact on the strategic balance than the moderate improvements in warhead efficiency which would come from continued testing.

b. Major changes in knowledge of weapons effects are much more likely and much more difficult to predict than improvements in efficiency (except for the uncertain prospect of fission-free weapons). With continued testing, both sides would learn much more about the effects, for example, of nuclear weapons on communications, radars, hardened sites and anti-missile systems. Although the Soviets may be ahead in a few specific areas (e.g., phenomena associated with very high yield weapons) in general the United States probably knows more about the relevant effects. While the prospects for some systems, including ballistic missile defenses, would be aided by effects testing, most strategic systems now under development depend on progress in other technologies.

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It is true that further testing may, and is perhaps likely to, lead to weapons effects "breakthroughs" for both sides but it is difficult to predict their nature.

c. Overall, the trend is towards greater equality in major nuclear forces between the U.S. and the USSR. The USSR will, over the next few years, almost certainly be able to inflict even greater civil change on the U.S. and Western Europe than it can today. It is also likely to reduce our margin of military superiority although the rate at which this may occur is uncertain and will probably be affected more by factors other than changes in weapons efficiency.

2. Tactical Nuclear Forces

a. The United States today has a larger and more diversified tactical nuclear arsenal than the Soviets. However, the Soviet stockpile is growing rapidly. Continued testing would enable the Soviets to catch up in this technology if they were so motivated. More importantly, both sides might develop pure fusion weapons which would be very much cheaper (Possibly by about 100 times) than present weapons.

b. It is difficult to evaluate the advantage, if any, that the United States derives from its current superiority in tactical nuclear weapons. In an extended, local, tactical nuclear campaign, it could turn out that the size and diversity of the U.S. nuclear arsenal would be decisive. And our tactical nuclear superiority might, even in a global nuclear war, help substantially in the defense of Europe. However, a local tactical nuclear war promises to be extremely volatile; and local battlefield considerations are likely to be dominated by other considerations in a major nuclear war.

B. Effects of a Comprehensive Test Ban

a. A comprehensive ban would slow the rate of increase in yield-to-weight ratios. However, since the practical limits of technology are now being approached at the high end of the yield spectrum, the ban will probably not have a major impact on high yield systems. Towards the middle and lower end of the yield spectrum the U.S. advantage would persist. This would leave us in a better position to use multiple warheads in small missiles and to develop still smaller, somewhat cheaper, missiles.

b. A comprehensive ban would also leave a number of weapons effects issues unsettled and others undiscovered. The development of anti-missile systems would be slowed somewhat but would not be prevented. U.S. and Soviet efforts to understand the currently not-well-understood effects of nuclear weapons on communication and radar systems would be severely hampered.

c. If the Soviets were to cheat they could further improve their yield to weight ratios, especially in low weight weapons. A wide range

of tests could be carried out below the presently estimated thresholds of the Geneva and National systems. Moreover, there would be some chance that a major continuing Soviet program of testing and introducing new improvements into their delivery systems would be detected by the United States. ~~Even if a covert Soviet program was undetected for some years, it would not be likely to produce a substantial Soviet military superiority or to deny us the ability to inflict massive civil damage in a second strike, although the overall U.S. military position could be seriously weakened.~~ *affected.*

2. Tactical Nuclear Forces

a. If observed by both sides, a comprehensive ban would perpetuate to some extent the U.S. tactical nuclear superiority. However, the Soviets could produce a very large number of nuclear weapons with properties likely to be highly effective on the battlefield. As was noted above, it is difficult to envision the circumstances in which this superiority is important. With cheating, the Soviets could pull abreast of the United States in this class of weapons.

C. Effects of an Atmospheric Test Ban

1. Strategic Retaliatory and Defense Forces

Most of the important weapons effects tests could not be carried out. Some effects tests could be conducted underground with some loss in efficiency. With underground testing, both sides could continue to improve the efficiency of warheads up to megaton yields. In short, most of the weapon design improvements that appear to be of importance could be managed underground; there would remain some important uncertainties - probably on both sides - with respect to certain weapon effects.

2. Tactical Nuclear Forces

An atmospheric test ban would have no effect on the development of tactical nuclear forces. Again in comparison to a comprehensive ban, it would eliminate the danger of Soviet unilateral advances by cheating.

D. Conclusions

1. With continued testing, the U.S.-Soviet military balance would probably only be effected significantly, if at all, by the results of effects tests. Developments in this area are difficult to predict. There are risks both in our not understanding these effects and in the Soviets discovering new ones. Further improvements in the efficiency of strategic and tactical weapons do not appear in themselves likely to lead to major changes in the military balance. This balance is changing, however, for other reasons, in the direction of reducing the U.S. nuclear edge.

2. A comprehensive test ban, if observed by both sides, would deny information on weapons effects, would slow the rate of increase in yield-to-weight ratios and would greatly slow advances in radically new technologies (such as fission-free weapons). On balance, such a ban, if observed is likely to be to the advantage of the U.S. If the Soviets were to cheat the U.S. relative military position would be worsened. However, the U.S. ability to inflict massive civil damage in a second strike does not appear to be in doubt.

3. An atmospheric test ban would prevent both the U.S. and the USSR from obtaining weapons effects information. It would avoid the risk of undetected Soviet unilateral nuclear advances.